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INFORMATION REPORT INFORMATION REPORT

CENTRAL INTELLIGENCE AGENCY

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S-E-C-R-E-T

COUNTRY Hungary

SUBJECT 1. Air Force Bombardier Training
2. Bombsights

PROCESSING COPY

REPORT [redacted] 50X1-HUM

DATE DISTR. [redacted] 1957

NO. PAGES 7

REQUIREMENT NO. RD

REFERENCES

DATE OF INFO. [redacted]

PLACE & DATE ACQ. [redacted] 50X1-HUM

SOURCE EVALUATIONS ARE DEFINITIVE. APPRAISAL OF CONTENT IS TENTATIVE.

[redacted] 50X1-HUM

[redacted]

Attached is a sketch showing various features of an OPB-1C bombsight.

[redacted] 50X1-HUM

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STATE	ARMY	NAVY	AIR	FBI	AEC			

(State Washington distribution indicated by "X"; Field distribution by "#".)

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S-E-C-R-E-T REPORT

COUNTRY Hungary

DATE DISTR. 5 Apr. 1957

SUBJECT Hungarian Air Force Bombardier Training and Bomb Sights

NO. OF PAGES 6

DATE OF INFORMAT

REFERENCES:

50X1-HUM

PLACE ACQUIRED

THIS IS UNEVALUATED INFORMATION

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Hungarian Air Force Bombardier Training and Bomb Sights

Bombardier Training

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Students flew about 112-114 hours first in the LI-2 where all phases except radio navigation were practiced, and then in the TU-2.

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Bombing System

bombing systems in the TU-2 and the IL-28, very similar, except for the addition of radar in the IL-28. Both utilized the same bomb-release mechanisms, which were the DER type shackles, and which released electro-pyrotechnically. Salvo release could be obtained electrically or mechanically. The DER 19 was used with small bombs, up through 250 kg. in size. The DER 21, which was identical to the DER 19 but about one-third larger, carried up to 2000-kg. bombs. On the IL-28 there were four longerons running through the bomb bay. They were spaced about equally, with the upper two being at approximately the 10:30 and 13:30 position. The DER-21 was attached to these upper two longerons when carrying 500-kg. bombs or larger. There were three equally spaced positions for the DER-21 on each longeron in the TU-2 and four in the IL-28. When carrying 250-kg. bombs the DER-21 shackles were removed and a "V"-shaped rail was used instead. It was located in the top center and ran the full length of the bombbay; it was held in place by the same retainer on the longeron that held the DER-21 shackles. Three DER 19 shackles were mounted side-by-side on the "V" rail as shown below:

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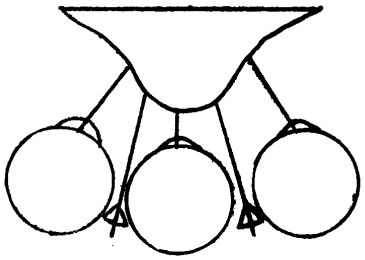

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There were four such "clusters of three" along the [illegible] in the IL-28 (three in the TU-2) which permitted carrying a total of twelve 250-kg. bombs. To assist in [illegible] the clustered bombs, a steel cable arrangement about 50 cm. in length projected between the bombs as shown in the sketch. On the end of this cable was a form of eye bolt that was notched or threaded so that a triangular wedge could be locked in position between the bombs. By depressing a lever in the wedge, it was slid up into the desired position between the bombs.

Bombs Used

[redacted] bombs used by the Hungarian Air Force [redacted] were either Soviet, or Hungarian-produced copies. The following types and sizes were in the Hungarian stockpile:

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Fragmentation	5, 25, 50, 100, 250	kg
High Explosive	50, 100, 250, 500	kg
Armor-Piercing	50, 100, 250	kg
Incendiary	5, 25, 50, 100, 250	kg
For Bridges	50, 100	kg
Illumination	25, 100	kg
Fragmentation & Incendiary	5, 25, 50, 100, 250	kg
HE and Incendiary	50, 500	kg
Chemical and Fragmentation	5, 25, 50, 100, 250	kg
Air Mines	500, 2000	kg
Mother Bomb	500, 1000	kg
Chemical	+, ++, +++	

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[redacted] The bomb for use against bridges had one grapnel hook welded on at 90 degrees on either side of the carrying hook to slow or stop the bomb in order to obtain maximum damage. The illumination bombs used a parachute and had a maximum burning time of approximately five minutes. [redacted] the H.E. incendiary and fragmentation incendiary [redacted] an oil or other liquid fuel was used to obtain the incendiary effect. The chemical fragmentation bomb was reportedly very deadly. Air mines contained a much higher percentage of explosive than H.E. types. Time fuses were used with it to obtain air burst. A few of the older types were spherical but the majority had conventional shapes. The mother bomb had conventional fins, an impact fuse, and scattered small fragmentation or H.E. bombs when it exploded after striking the ground. These were for use against troops or other live targets. [redacted] chemical-bomb [redacted] were known only as 1 plus, 2 plus, and 3 plus types. Some of these contained very toxic gases. [redacted] all but the spherical bomb had conventional shapes.

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Bomb Fuses

[redacted] all H.E. bombs above 100 kg. could use side fusing and [redacted] all bombs above that size had to have at least

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two fuses. All AP bombs used side fusing since they had no nose fuses. a 500-kg. H.E. bomb 50X1-HUM with three side fuses plus the nose and tail fuse. 50X1-HUM bombs, Regarding larger those of one-ton size might use as many as five to seven fuses. 50X1-HUM quantity of fuses was to assure positive detonation rather than the 50X1-HUM a higher order of detonation. The side fuses were usually the time-fuse type that used a powder train for delay after the vane flew off after a very few turns (a rough sketch resembled the AGDT). They were held in the safe position, in the aircraft, 50X1-HUM by a safety fork attached to the same beam as the shackle. another type of side fuse contained a vial of an unknown chemical which acted on a membrane, after striking the ground, to obtain delay action. 50X1-HUM

Bomb Sight OPB-1C

5. 50X1-HUM there was an OPB-1, 1D, 1C, and OPB-10. The OPB-1C was newer than the OPB-1D although it carried the "C" designation. The only changes 50X1-HUM were a few minor refinements and an additional lens. The OPB-10 was used in the IL-28 The only refinement of the 1-C in the 10 was the addition of a vertical control stick located somewhere on top of the computor mechanism, 50X1-HUM near where the eye-piece was located, which permitted the bombardier to steer the aircraft toward the target during the bombing run. the control stick was electrical but 50X1-HUM the autopilot was hydraulic. The OPB-1C sight shown on Inclosure 1 was a very good sight A superior bombardier can complete a bomb run in 10 seconds, a good one in 20 seconds; 30 seconds was considered satisfactory. 50X1-HUM

6. Inclosure 1 is a sketch of the OPB-1C Sight. Numbers in parentheses refer to numbers on the sketch.

(1) Prism Drive Shaft - flexible steel cable.
(2) Lens
(3) Search and Track Knob.
(4) Lens 50X1-HUM
(5) Computor - for fixed-angle bombing.
(6) Eyepiece - lense system magnified to 1.5 power.
(7) Wind Speed Indicator - corrected by computor.
(8) Drift Indicator
(9) Wind-Speed Scale 50X1-HUM
(10) Wind-Direction Indicator
(11) Stop Watch - for measuring ground speed and actual time of fall.
(12) Wind-Direction Knob

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(13) Wind-Speed Knob
(14) Ground Speed Knob and Indicator
(15) Bomb Characteristics Knob and Scale
(16) Light Switch - for dials.
(17) Lens Heater Switch
(18) Static Air Inlet
(19) Rain Air Inlet
(20) Concave lens
(21) Bomb-release switch
(22) Right-Turn Signal Button
(23) Left-Turn Signal Button
(24) Lens
(25) Mount
(26) Lens - with dot in center.
(27) Prism
(28) Scale In Lens System - calibrated in degrees.
(29) Sighting-Angle Index
(30) Release-Angle Index
(31) Base Plate
(32) Release Pedal

On the right side of the computer, and not shown, was the on-off switch and the Delta height knob and scale. This Delta height scale was used when the target height was known. Regarding the bomb characteristics knob, [redacted] all bombs had a characteristics value of either 19, 20, or 21, with the latter being the better setting. Left and right turn push-button type switches were mounted on the side of the junction box. They signalled the pilot during the bomb run in case of radio failure. The right-turn button flashed a green light and the other a red light. The bomb-release button on the junction box could also be made to operate the type AFA-1M camera during practice bombing. The impact point was calculated from the photo. The field of vision of the optics was 15 degrees in diameter. The optics could be moved through 123 degrees, with the forward most position of the cross hair being 1.5 degrees above horizontal. [redacted] there were no provisions in the sight to correct for cross trail. This error was considered negligible unless winds were unusually high, under which condition [redacted] would estimate the necessary upwind distance. The fixed angle computor mechanism located on top of the sight was mechanically connected to the release-angle index and actually moved when the sight was operated automatically. When fixed-angle bombing was used, the computor moved the index to the desired release angle. During tracking the sighting index stopped when it reached the release angle index. By keeping the target in the upper field of vision the bombardier could have as much as 7 degrees warning time prior to bomb release. [redacted] the computor housing to be about 25 cm. square, the eye-piece to be about 10 cm. high, the periscope to be about 40 cm. long and six cm. wide.

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Bomb Sight OPB-1D

[redacted] knobs on the OP-1D: an

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instrument forward of the eyepiece was the stop watch. The knob on the right side of the eyepiece column was the search-track knob. On the left side of the column was the instrument light rheostat and the lens heater switch. The knob on the right side of the computor was the bomb characteristics knob. The forward knob on the left side of the computor was the target altitude knob. [redacted] 50X1-HUM [redacted] the 360-degree dial on top of the computor housing, [redacted] Point (8) of Inclosure 1 on the OPB-1C, was identical to this. After all information was set into the sight, one could turn the dial to the magnetic heading to which [redacted] intended to make the bombing run and read the degree of drift for that particular heading. The sight was then rotated the proper amount in the base plate. Wind speed was read from the window just forward of the compass dial. The toggle switch on the computor was the automatic-manual (on-off) switch. 50X1-HUM

IL-28

[redacted] 50X1-HUM

[redacted] it used the OPB-10 sight and a PPI scope. [redacted]

[redacted] The tail turret had 2X 12.7-MM UBK guns with 150 rounds each. [redacted] the turret gunsight [redacted] was a mechanical-optical type without gyro. [redacted] below the sight there was a rectangular plate which contained a longitudinal slot. Along the edge of the slot was a range of airspeeds which [redacted] represented the speed of the attacking aircraft. The speed of the attacker was set into the sight by a set-screw located in the slot which was moved to the proper position, thereby positioning the rod that connected it with the sight. When the guns were moved, the ends of the rectangular plate moved up and down. [redacted] 50X1-HUM

[redacted] production of the IL-28 was being stopped due to defects in its construction. They reportedly kept blowing up, during runup, in the air, or landing, etc. It appeared that no specific cause could be found. [redacted] production had been stopped once in 1955 but was continued because there was nothing with which to replace it. 50X1-HUM [redacted] 50X1-HUM the IL-28 could carry an atomic bomb, [redacted] the Soviets had small, medium, and large types, but [redacted] the TU-70 was actually designed to carry the atomic bomb. 50X1-HUM

[redacted]

Atomic Warfare

[redacted]

the Soviets now had an atomic weapon which would permit troops to enter the area 30 minutes after detonation.

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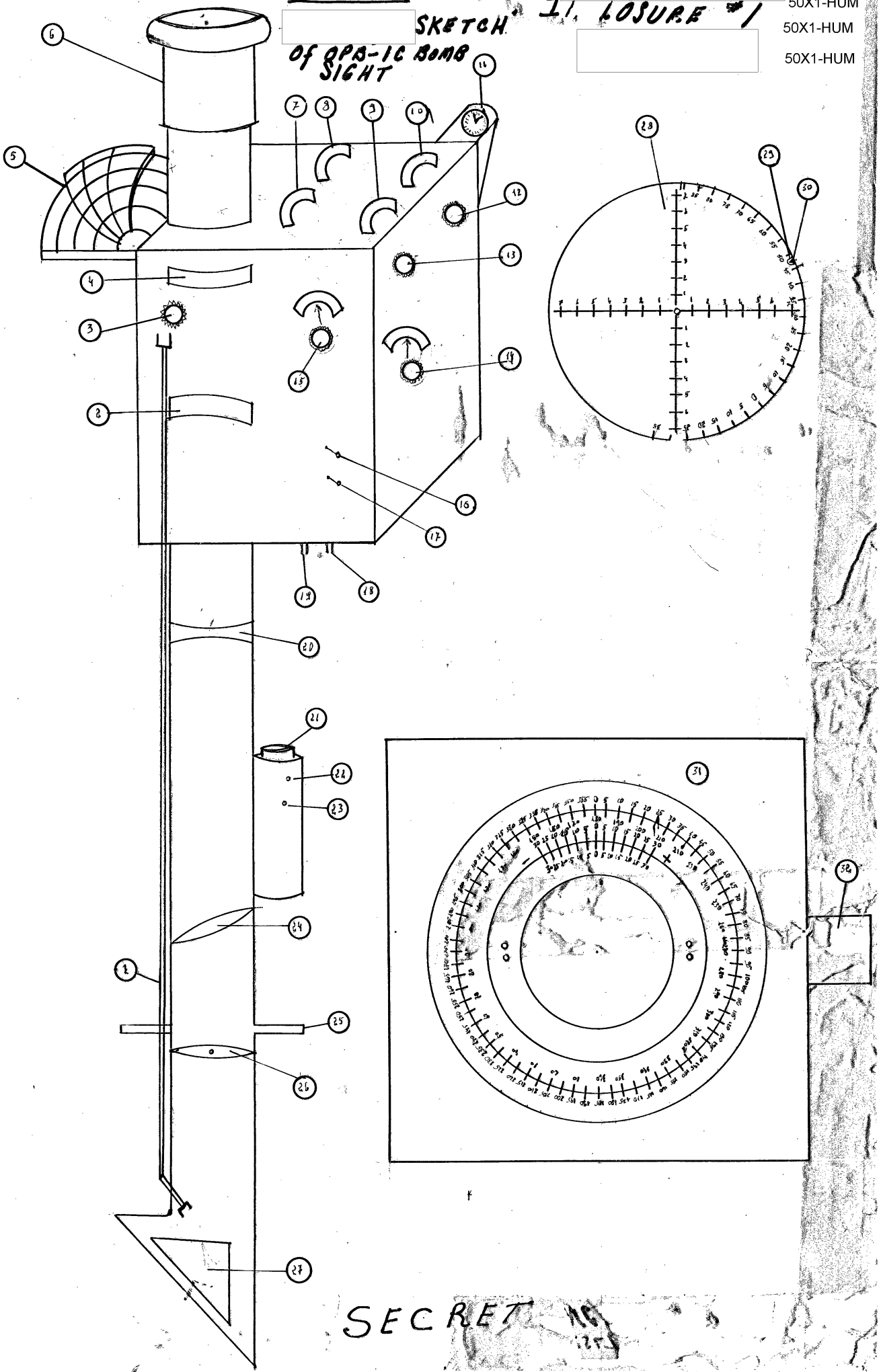
SKETCH OF RPB-1C BOMB SIGHT

ENCLOSURE #1



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